remarked that this rate refers to the large motion on the Milne seismographs, not to the felt shock, the discussion of which is deferred to the larger memoir promised.

Among miscellaneous effects of the earthquake it is mentioned that in some cases the flow of springs was more or less completely checked, while others increased or broke out in new places. In Sind and Burma the shock was not felt, but affected the bubbles of level tubes during survey operations, the movement in the former district indicating a surface tilt of about 30 seconds of arc above and below the horizontal, in a north-east–south-west direction.

HENRY JAMES CHANEY.

ON February 13 Henry James Chaney, who for more than forty years was an authority on our standards of weight and measure, ended his lengthy official career at Hampstead after a painful illness of some months' duration.

He was born at Windsor in March, 1842, was educated privately, and entered the Civil Service at an early age. In 1860 he was appointed to the Exchequer, the department in which at that time the statutory powers with respect to weights and measures were vested. Here he had the good fortune to come into contact with Airy and Miller, who had just completed their researches, undertaken at the instance of the Government, in connection with the restoration of the Imperial standards. Profiting by their advice and encouragement, he devoted himself with much zeal to the technical duties which were imposed upon his department by the Sale of Gas Act, 1859. Under the direction of H. W. Chisholm, the Warden of the Standards, he took an important part in perfecting the official apparatus for verifying gas-measuring instruments. He acted as secretary to the Standards Commission, 1867–71, and had much to do with the preparation of the voluminous appendices to its reports.

On the abolition of the separate office of Warden of the Standards in 1878, Mr. Chaney was placed in charge of the Standards Department of the Board of Trade. As superintendent of weights and measures he was responsible for the model regulations with respect to weights and measures on which the local regulations throughout the country have been based. He was for many years the representative of the United Kingdom on the Comité International des Poids et Mesures, and took an active share in its proceedings. When the metric system of weights and measures was made permissive in this country in 1897, Mr. Chaney compiled the new tables of metric equivalents which were legalised the following year by Order in Council.

Mr. Chaney's scientific writings are for the most part to be found in the periodical publications of the Standards Department, and include, *inter alia,* "Report on the Standards of Measurement for Gas," "Verification of Standards for the Governments of India and Russia" (1877), "Screw Gauges" (1881–3), "Densities and Expansions" (1883), "Expansion of Palladium," "Re-comparison of the Imperial and Metric Units" (1883), "Verification of the New Parliamentary Standards of Length and Weight" (1881–3). His "Re-determination of the Mass of a Cubic Inch of Distilled Water" (Phil. Trans., 1892), which was intended to serve as a basis for calculating the relation between measures of capacity and volume, gave for the cubic contents of the gallon the value 277·463 cubic inches, a much better approximation than the value 277·274 cubic inches, due to Kater, which was accepted up to that date. The researches which have since been undertaken at the Bureau International des Poids et Mesures, and are still in progress, have yielded a provisional result for the mass of a cubic decimetre of distilled water at its maximum density which leads to the value 277·420 cubic inches for the cubic contents of the gallon. This does not differ much from Chaney's result, and is to be considered as the best determination up to date.

His well known work "Our Weights and Measures," which appeared in 1897, contains a mass of metrological information not readily accessible elsewhere. One of his latest contributions to science was the article "Weights and Measures" in the supplement to the ninth edition of the "Encyclopædia Britannica." His last official publication was a report on the "Construction and Verification of a New Copy of the Imperial Standard Yard" (1905).

His great experience in precise measurement caused him to be regarded as a valuable cooperator, and his advice was frequently sought by official committees. The Imperial Service Order was conferred upon him in 1902, and the services rendered by him in connection with the restoration of the Russian standards of weight and measure were recognised by the present Tsar as well as by his grandfather, Alexander II.

Mr. Chaney's name has long been familiar in metrological circles, and his death has removed another link with the past. The memory of his kindly disposition and ready assistance will be treasured by all those who were in any way associated with him.

NOTES.

WE are informed that the council of the Royal Society has selected the following candidates for election as fellows of the society:—Dr. C. W. Andrews, Mr. G. T. Beilby, Mr. F. F. Blackman, Prof. T. J. I'Anson Bromwich, Mr. P. H. Cowell, Mr. W. Heape, Mr. J. H. Jeans, Dr. C. H. Lees, Captain H. G. Lyons, R.E., Prof A. B. Macallum, Mr. J. E. Marsh, Dr. P. Chalmers Mitchell, Mr. J. Swinburne, Prof. H. A. Wilson, Prof. A. E. Wright.

A MEETING was held at the Mansion House on Monday, the Lord Mayor presiding, to consider what steps should be taken to commemorate the discovery by Dr. W. H. Perkin fifty years ago of the first artificial colouring matter obtained from a coal-tar product, and to celebrate the great development of the coal-tar colour industry thus started. A note describing the origin and nature of the movement appeared in these columns on February 15 (p. 370). The proceedings at Monday's meeting were opened by Lord Halsbury, who moved:—"That, in view of this being the fiftieth year of the foundation of the coal-tar colour industry, it is desirable that steps should be taken to memorialise the event and to do honour to Dr. W. H. Perkin, the founder." Sir William Bousfield seconded the motion, which was supported by the Master of the Leathersellers' Company and Prof. H. E. Armstrong, and unanimously carried. Lord Rayleigh moved:—"That an appeal be made in this country and abroad for subscriptions for the purpose of carrying out the following objects:—(1) The presentation to Dr. Perkin for his lifetime of an oil portrait of himself, executed by an eminent artist, the portrait to become the property of the nation at his death. (2) The execution of a marble bust of Dr. Perkin to be placed in the rooms of the Chemical

Society. (3) The establishment of a 'Perkin Research Fund' for the promotion of chemical research to be administered through the Chemical Society." This resolution, which was also adopted, was seconded by Sir William Ramsay, and supported by Sir Henry Roscoe and Mr. David Howard. It is unnecessary here to detail the steps in the growth of the German coal-tar colour industry which is the commercial outcome of Dr. Perkin's discovery—an industrial development by which this country might have been expected to benefit. But, as a correspondent writes in the *Times* of February 24:—"Although in this country there have never been wanting capable chemists able to carry on and extend the manufacture of colouring matters, there has been complete lack of understanding on the commercial side of the complex requirements of the industry and complete lack of sympathy between the capitalist and the scientific worker. The failure must be credited to our universities and to our faulty system of higher education—to our inbred Philistinism. Little, if anything, has been done either in school or university to evoke in the community even an elementary understanding of the principles of science and of their application to commerce and industry. We are now paying the penalty of our neglect." To secure that the nation shall derive full industrial value from scientific discoveries will be possible only when we have developed a system of secondary and higher education in which modern needs and modern methods are recognised; for not until then will there be among us a generation of employers and capitalists able to understand expert opinions and with scientific imagination enough to read the signs of the times.

The encroachments of the sea on parts of our coasts, and the question of national responsibility for the protection of the seaboard against such erosion, was raised in the House of Commons on Monday in an amendment to the Address. Several members urged that the Government should give financial assistance for the construction of works for coast protection and afford facilities to local authorities for obtaining loans on easy terms for the defence of the sea coast. The President of the Board of Trade stated that the Government has decided to have an inquiry in the form of a Royal Commission, which will extend not merely to coast defence, but to two or three other kindred subjects, such as waste lands and probably afforestation. A Commission will be appointed at an early date to inquire into the matter. Some objections to the expenditure of Imperial funds upon the protection of private property at sea-side resorts and other localities were stated in an article in Nature of February 15 (p. 309).

Several years ago a commission was appointed by the Imperial Academy of Sciences of Vienna to collect phonographic records to be preserved for scientific study. Some of the results obtained by expeditions to Kroatia, Slavonia, and Lesbos were described in Nature of January 29, 1903 (vol. lxvii., p. 301). The Vienna correspondent of the *Pall Mall Gazette* now states that from North Tyrol and Vorarlberg fifty-seven specimens of German dialects have been obtained for the archives, and another forty-seven from Carinthia. From New Guinea have been sent thirty-two phonographs recording the language and music of the natives, with especially interesting war songs and the accompanying drum music. From India have been received valuable records of old Sanskrit songs. An expedition which was sent out to Australia is now on its way back, and another party is about to start for Greenland.

It is stated that the new director of the Vatican Observatory will be Father J. G. Hagan, S.J., professor of astronomy in Georgetown University, U.S.A., and director of the observatory there.

In connection with the indication by the London County Council of houses in London which have been the residences of distinguished individuals, a memorial tablet was erected on Monday on No. 110 Gower Street, where Charles Darwin resided from 1839 to 1842.

Mr. E. T. Whittaker, F.R.S., has been appointed Andrews professor of astronomy in the University of Dublin, in succession to the late Prof. C. J. Joly, F.R.S. The appointment carries with it the office of Royal Astronomer of Ireland.

A Reuter message from Paris states that the committee of the Alliance Française-Britannique received at the Sorbonne on Monday the delegates of the London branch of the Alliance, headed by Sir Archibald Geikie, F.R.S., the chairman. M. Liard, Vice-Rector of Paris University, and M. Levasseur, director of the Collège de France, and honorary president of the Alliance Française, welcomed the British delegates. After Sir Archibald Geikie had delivered an address on geology, the British guests visited the laboratory and the large amphitheatre of the Sorbonne. In the evening they were present at a banquet given in their honour, the Minister of Public Instruction being in the chair.

We learn from the *British Medical Journal* that the next meeting of the Congress of Experimental Psychology will be held at Würzburg, April 18–21. Among the communications promised are the following:—Dr. F. Krüger, on the relations between experimental phonetics and psychology; Prof. O. Külpe, on the present position of experimental æsthetics; Dr. F. Schumann, on the psychology of reading; Prof. R. Sommer, on psychiatry and the psychology of the individual; Dr. W. Weygandt, on the psychological investigation of congenital feeble-mindedness. Communications relative to the congress should be addressed to Prof. O. Külpe, Würzburg.

About two years ago steps were taken to erect a fitting memorial to James Watt at his birthplace. This is to take the form of a commemorative public building and statue at Greenock. In the *Engineer* of February 23 disappointment is expressed that an object so obviously worthy, and an appeal so influentially prosecuted, should not have had greater success. Only 700*l*. has been subscribed in Great Britain and 190*l*. in America. Influential canvass, nevertheless, was made by Mr. Carnegie in the United States, while in Great Britain Dr. Robert Caird sent out 10,000 circulars inviting subscriptions. The balance required, 9300*l*., has been contributed by Mr. Carnegie.

Ornithology has lost its oldest votary by the death, on February 20, of Prof. Jean Louis Cabanis, for many years in charge of the collection of birds in the Museum of Berlin. Born in 1816, his earliest work of importance seems to have been the ornithology of Tschudi's "Fauna Peruana" in 1845 and 1846. He afterwards did the same service for Sir Richard Schomburgk's "Reisen im Britisch-Guiana"; but the "Ornithologische Notizen" in the *Archiv für Naturgeschichte* for 1847 almost marked a new epoch in the progress of the science, for they were written in conjunction, it may be said, with Johannes Müller, and practically applied the principles of taxonomy laid down by that great anatomist, in his contributions to the Academy of Sciences in Berlin in 1845 and 1846, On certain variations in the vocal organs of the Passeres—

a line of investigation so well worked out subsequently in this country by Garrod and Forbes. In 1853 Cabanis established the *Journal für Ornithologie*, of which he remained editor until succeeded in 1893 by his son-in-law, Prof. Reichenow, and with that journal—the prototype of the *Ibis*, and hence of several others—his name will be ever associated. The "Museum Heineanum" is another work by which he will be remembered; but the abovementioned "Ornithologische Notizen" must be regarded as by far his greatest performance, and, of course, they excited no attention in this country for many years.

MR. MORTEN P. PORSILD informs us that during the summer of the present year a permanent station for the study of Arctic science will be established on the south coast of Disco Island, in Danish West Greenland. The cost of the foundation is to be defrayed by a gift from Mr. A. Holck, of Copenhagen, and the Danish Government has promised an annual grant of 600*l*. towards its maintenance. A laboratory, equipped with appliances and instruments, especially for biological researches, will be attached to the station, and work-places will be furnished for visiting naturalists, foreign as well as Danish. The establishment of two such places is contemplated at present. The visitors will be allowed free use of instruments, travelling outfit, and library of the station; lodging will be free, and a small fee only will be charged for board. The first visitors will be received in 1907, and notices, inviting application, will be issued in due course. A library of Arctic literature is to be founded at the station, and is to be made as complete as possible. Mr. Porsild, the leader of the station, whose address until May 1 next is Copenhagen, S., Denmark, will be glad to receive presentation copies of works on Arctic and Antarctic subjects, especially on Arctic biology, for addition to the library.

MR. BALFOUR proposed the toast "The School and Union" at the annual dinner of the Students' Union of the London School of Economics and Political Science held on February 24. Answering the question, What is it we mean by economics in its wider sense? Mr. Balfour spoke of the scientific character of the study of economics, and went on to say:—"Science, if it means anything, means a progressive knowledge, and I confess I detest the habit of the unreasoning appeal to authority, especially when, as is often the case, the authority is somewhat antiquated. In science there is, or ought to be, no such thing as authority whatever. A man of science builds, and gratefully builds, on the foundations left by his predecessors; but they are but foundations. It is his business to raise tier after tier the fabric of ever-progressive knowledge." Later Mr. Balfour said he desired to see the school "inspired with that detached and disinterested scientific spirit which is, after all, the true origin of all progress in this world." We note with pleasure this frank recognition of the value of the scientific spirit in all branches of learning and in every department of enterprise by a great politician, and we look forward to the time when every human activity in this country will be governed by the methods of science and imbued with its spirit.

DURING the past few days the following reports of seismic disturbances have appeared in the daily papers:—*February* 21.—Shemakha (Government of Baku), Earthquake was felt at 12.10 a.m. Fort de France, Earthquake shock was felt at 12.13 p.m. St. Lucia, Severe earthquake occurred at 8.30 p.m. Other shocks were afterwards felt at frequent intervals. Mont Pelée, Martinique, is active. At Fort de France many houses have been demolished by earthquakes. La Soufrière, the St. Vincent volcano, is more active than it has been since 1902. Buenaventura, Colombia, Earthquake lasting seven minutes occurred at 10.35 a.m., the movement being from north to south. After the earthquake there was a huge wave, which was of no consequence at Buenaventura; but according to reports from the coast so far as 50 leagues to the south, 2000 persons were killed by falling houses or drowned by the wave, whole families being lost.

ACCORDING to the *Chemiker Zeitung*, the General Electrical Company, of Berlin, in conjunction, it is said, with the firm of W. C. Heraeus, of Hanau, intends to start a company for the production of mercury lamps made out of quartz glass.

ON February 10 Prof. van 't Hoff gave a lecture on thermochemistry before a large gathering of members and guests of the Austrian Engineers' and Architects' Society in Vienna. After a few preliminary remarks on the heat of reaction and combination of chemical substances and their calorimetric measurements, Prof. van 't Hoff dwelt upon the heat of alcoholic fermentations, of thermite decomposition and of various illuminants, pointing out the great amount of heat developed in the decomposition of acetylene and the pressure developed in explosions, and finally discussed the relations between heat development and chemical affinity, referring at length to Berthelot's principle, which would find a measure of chemical affinity in the heat developed, but which Prof. van 't Hoff declared untenable. The lecturer concluded with the remark that this subject of thermochemistry was one in which a more general application of modern chemistry was most desirable; he was, however, of the opinion that it was the duty of the man of science to seek out new ways and to find out new laws, but that here his duties ceased, whilst the practical technical man must himself sort out that which was necessary and usable. After the lecture the leading chemists and physicists of Vienna entertained Prof. van 't Hoff to a dinner given in his honour.

As was mentioned in NATURE of February 1 (p. 322), the sixth International Congress of Applied Chemistry will be held this year in Rome from April 25 to May 3. It may be remembered that the first congress was held in Brussels in 1894, the second in Paris in 1896, the third in Vienna in 1898, the fourth in Paris in 1900, and the fifth in Berlin in 1903; a desire has been expressed that the seventh meeting should be held in England. All communications and applications for membership of the sixth congress should be addressed to the Ufficio del Congresso, Via Panisperna, 89, Rome. The subscription fee of 20 lire is to be forwarded by P.O.O., made payable to Prof. Giovanni Giorgis, the treasurer of the congress. Upon application a pamphlet will be forwarded containing all information requisite for applicants, together with the regulations of the congress, a list of Italian and foreign committees, a list of the sections, and the titles of papers and communications that have been announced up to the present. The English committee contains some thirty-three names of representatives of fifteen leading scientific societies connected with chemistry, including the Royal Society, the Chemical Society, Society of Chemical Industry, Society of Public Analysts, the Iron and Steel Institute, the Faraday Society, the Institute of Chemistry, &c. In addition to the sectional meetings, which are to take place on April 27, 28, and 29, and on May 1 and 2, lectures of a general nature will be arranged (such lectures by Profs. H. Moissan, Sir W. Ramsay, and O. N. Witt are announced), a social gathering of the members will take place on the evening of April 25, an excursion in the neighbourhood of Rome will be made on Sunday, April 29, and two alternative excursions, the one to Sicily and the other to the Island of Elba, to places of chemical interest on May 3; as the number of participators in the latter is limited, preference will be granted to those who are first to send in their names, and more especially to foreign members. Members may further obtain a reduction of 40 per cent. to 60 per cent. on the Italian State Railways, and 60 per cent. on tickets issued by the navigation companies Navigazione Generale Italiana and La Veloce. The papers to be contributed will be grouped in eleven sections, and may be in one of the four official languages of the congress, namely, Italian, French, German, and English. The discussions after the reading of the papers may also be carried on in one of these languages.

Museum News for February records the addition to the Brooklyn Museum, New York, of a skeleton of the sperm-whale, measuring 47 feet in length, which has been suspended to the roof of the building.

IN the *American Journal of Science* (February) Mr. C. C. Trowbridge re-opens the disputed question of the interlocking of the emarginate primary flight-feathers in raptorial birls, adducing apparently conclusive evidence that this takes place in certain American hawks, with a resulting increase of wing-power.

THE contents of vol. lxxx., part iv., of the *Zeitschrift für wissenschaftliche Zoologie*, comprise a paper by Dr. E. Strand, of Christiania, on the structure and development of spiders; a second, by Mr. J. Wilhelmi, on the excretory organs of the fresh-water turbellarian flat-worms of the section Tricladida; and a third, by Dr. C. Hennings, of Rostock, on the "tömövarysche" organ in myriapods. The latter is the continuation of a paper the first part of which appeared in the same journal in 1904. A systematic classification of the myriopods is given.

IN the report of the Maidstone Museum, Library, and Art-Gallery for 1905 is published a photographic reproduction of an original drawing by the late Mr. W. H. Bensted of the well known slab (now in the Natural History Museum) containing a large portion of the skeleton of a young iguanodon, obtained by him from the ragstone quarry in Queen's road, Maidstone, in 1834. The drawing is, of course, mainly of historical interest. An offer of the loan, for an indefinite period, of an exceedingly valuable, and in this country almost unique, collection of Japanese pottery, made by the Hon. H. Marsham, has been accepted by the museum authorities.

THE January issue of the *Emu* contains an excellent portrait of the late Captain F. W. Hutton. From the report of the proceedings of the fifth session of the Australasian Ornithologists' Union, held at Adelaide, which appears in this number, we learn that the acting president devoted his address to the subject of European and other birds introduced into Victoria. The two species that have thoroughly established themselves are the starling and the sparrow. No one appears to have a good word for the latter, but as regards the former it is stated that the residents in Riverina are longing for its arrival in numbers to help them to cope effectually against the armies of locusts and caterpillars that frequently infest those districts. Thrushes, blackbirds, and greenfinches have established themselves to a small extent in and around the districts where they were first liberated, but chaffinches, yellow-hammers, and siskins have practically failed to accommodate themselves to their new surroundings.

IN discussing the early stages of the Palæozoic rugose corals, as a clue to the origin and relationships of the group, Mr. C. E. Gordon, in the February number of the *American Journal of Science*, finds himself unable to accept Mr. Duerden's views as to the close connection between the ancient tetrameral and the modern hexameral types of corals. On the contrary, he is of opinion that we are not yet in a position to define their relationships or to state which is the earlier of the two. In a second paper in the same journal Mr. C. R. Eastman discusses the affinities to the lung-fishes presented by the group of armoured Palæozoic fishes typified by Coccosteus, and commonly known as the Arthrodira. From the study of the North American genera Dinichthys, Dinomylostoma, &c., the author comes to the conclusion that the alleged relationship is well founded, thus confirming the views of Dr. A. Smith Woodward. The author goes, however, somewhat further, and urges that while the living Australian *Ceratodus* (*Neoceratodus*) *fosteri* bears an intimate relation to Arthrodira on the one hand, and to the Palæozoic Dipterus and its allies on the other, yet that it is a more primitive type than any of these. It represents, in fact, the direct line of descent from primitive Palæozoic Ceratodonts, from which Dipterus and its allies diverged in one direction and the Arthrodira in the other. Hence the Dipnoi cannot be descended from the crossopterygian ganoids, but are more probably derived from Pleuracanthus-like sharks. Further, the association of the Arthrodira with the Ostracophora (Pterichthys) in one group, Placodermata, becomes obviously impossible. Mr. R. S. Lull points out that the name Ceratops proposed by Marsh for the Laramie horned dinosaur is preoccupied, and he accordingly suggests the new name Proceratops, with Agathaumidæ as the family title.

THE *Pioneer Mail* remarks that the immunity of Europeans continues to be one of the most noticeable features of the plague epidemic. Last year, in the Bombay Presidency, where the disease carried off more than a quarter of a million people, only nineteen Europeans in all were attacked, of whom ten died. In the previous year, in the same region, where 316,000 deaths took place, only eight were amongst Europeans.

MR. A. ELENKIN, writing in the *Bulletin du Jardin impérial botanique*, St. Petersburg (vol. v., part v.), on the marine algæ found near the biological station at Mourmane, discusses the different forms of Lithothamnin, and describes a new species characterised by the development of bicellular spores.

IN recording his impressions of the botanical congress at Vienna in the *Bulletin de l'Académie de Géographie botanique*, Mr. L. Navas, who represented the Société Aragonaise des Sciences naturelles, presents his arguments in favour of giving the authority for the genus and not the authority for the binomial name of a plant.

A PERIODICAL bulletin—*Le Bambou*—devoted to the study of the bamboo, its cultivation and uses, has been started by Mr. J. H. de Lehaie, Mons, Belgium. The first number, published January 15, contains an article on the flowering and seeding of bamboos in Europe. From a study of the collated data, the writer concludes that in the section Arundinaria the majority of species flower gregariously, produce seed and die, but in the case of Phyllostachys the production of seed does not appear to be the harbinger of death.

In addition to the descriptions of a number of Indian forest fungi that Dr. E. J. Butler has been contributing to the *Indian Forester* (October to December, 1905), some of his remarks possess a more general interest. In connection with the genus Chrysomyxa, a heterœcious species in Europe produces teleutospores on rhododendrons and æcidia on the spruce. In India, both æcidial and teleuto stages of a Chrysomyxa have been found on *Rhododendron campanulatum*, thus giving grounds for an assumption that Chrysomyxa was originally confined to a single host. Dr. Leather also makes some definite statements on the subject of wheat rust, *Puccinia graminis*, and the æcidial stage that occurs on the barberry. In India, the stages on the wheat do not seem to depend upon the presence of barberry bushes, as the most destructive areas of rust were hundreds of miles distant, and, further, at the only part of the Himalayan range where *Aecidium berberidis* is known to occur black rust is extremely rare on cereals.

It has always been recognised that there is an uncertainty as to the plant that yields the Manila Elemi of commerce. Trimen and Bently, in "Medicinal Plants," referred it to a species of Canarium allied to *Canarium commune*, and later writers have generally referred it to that species. Mr. E. D. Merrill, the botanist in the Philippine Islands, with specimens before him of fruit, flowers, and the pitch locally known as "brea," assigns it to *Canarium luzonicum* in Publication No. 29 of the Bureau of Government Laboratories. Other species of Canarium yield brea, but, according to the writer, do not furnish the article of commerce. The same publication contains the third list of new or noteworthy plants that Mr. Merrill has identified. It includes a number of new species of Medinilla and Rhododendron; of the fourteen species of Rhododendron, thirteen are believed to be endemic.

In a note contributed to the *Atti dei Lincei,* xiv. (2), 12, Dr. G. Noè discusses the functions of the remarkable organs of sense first discovered by Hicks in 1857 on the wings of many species of Diptera.

In the *Memorie* of the Italian Spectroscopists' Society, xxxiv., 6, Messrs. A. Mascari and A. Cavasino discuss the effect of atmospheric disturbances on the outline of the sun's disc, with special reference to the direction of the wind and other meteorological conditions.

Members of the recent British Association party will remember enjoying English salmon for dinner one day on the voyage home from Beira. This reminiscence is suggested by a note in the *Revue générale des Sciences* from which we learn that an undertaking has successfully been carried out for obtaining in Paris fish from the French fisheries on the west coast of Africa, transported under cold storage.

In connection with Prof. Sydney Hickson's article on "Miners' Worm" (February 8, p. 344), attention may be directed to a paper by Gino Peri in the *Atti dei Lincei,* xiv. (2), 12, dealing mainly with the question as to how far *Ankylostoma duodenale* is parasitic on animals other than man. The author has succeeded in infecting dogs through the mouth and by penetration of the skin, and there are good reasons for believing that horses are also liable to infection.

M. Georges Claude describes in the *Journal de Physique* a series of apparatus for the separation of oxygen and nitrogen by the liquefaction of air. In these the necessary degree of cold is obtained by expansion accompanied by performance of external work, and the process of separation depends on the small difference between the boiling points of oxygen and nitrogen. The whole apparatus is of a compact form, and of two examples in actual working at Boulogne-sur-Seine, one is capable of generating 700 and the other 1000 cubic metres of 96 to 98 per cent. oxygen per diem.

The *U.S. Monthly Weather Review* for September last contains a graphic account of a tornado of marked severity which visited Carbondale, Pennsylvania, on August 30, 1905. Mr. W. M. Dudley, meteorologist in charge at Scranton, about sixteen miles distant, issued a circular of inquiry, and obtained special reports from neighbouring districts. From these it appears that a funnel-shaped cloud, from which vivid lightning played, moved across the northern portion of Carbondale in a south-west to north-east direction, covering a track two miles in length and from 25 to 200 yards in width. About thirty houses and other buildings were blown down, and some of the roofs were carried to a distance of 600 feet. The trees which were blown down fell to the eastward. The area affected was, as usual, very small, the storm being chiefly confined to the Carbondale district. At Scranton there was vivid lightning, but no other special characteristics were observed; the barometer was low, reading 29·64 inches, but remained steady; there was no noticeable increase in the wind velocity, and very little rain fell. The passage of the cloud, which appeared to revolve in a backward direction, was accompanied by a heavy rumbling noise. The illustration, from one of the photographs taken, shows the effect of the storm on the buildings; the tornado occurred about 8h. 30m. p.m., but its duration is not stated.

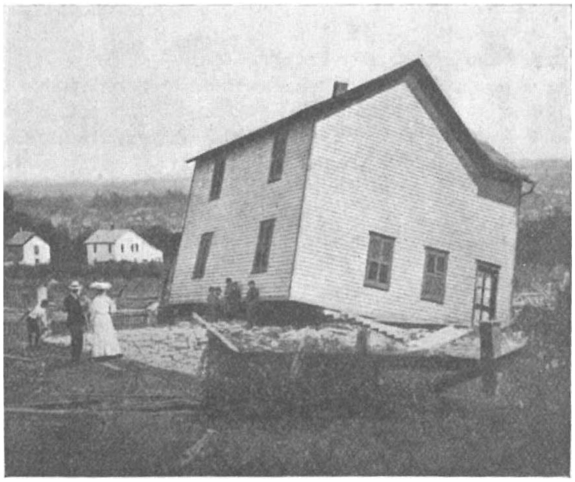

Fig. 1.—A building which was moved in line with the direction of motion of a tornado on August 30, 1905.

M. Ch. Ed. Guillaume contributes to the *Revue générale des Sciences* for January 15 an interesting account of the career of Colonel Charles Renard, whose death took place in April of last year. From a popular point of view, Colonel Renard sprang into fame in 1884–5 in connection with the successful trips made by the navigable balloon *La France*; but his scientific work covers a wider range than this series of experiments, his inventions dating from 1875, when he devised a new air-valve for balloons, up to within a short time of his death. Among other innovations we notice the introduction of the coefficient of "laminage" in connection with problems of thermal conductivity between gases and solids; also improvements in the construction of boilers and surface condensers based on the same study, having for their object the construction of light motors for aërial navigation. Then, again, we find Renard turning his attention to portable hydrogen generators for military ballooning and pneumatic elevators for grain and other materials. Last, but not least, we have the motor train, exhibited in December, 1903, all the carriages of which were self-propelled by power transmitted from the motor through a series of jointed shafts. This train was successfully conducted round sharp corners through the streets of Paris.

THE February number of *Symons's Meteorological Magazine* commences the forty-first volume of this useful periodical. It began as a two-page "Rain-circular," intended to keep rainfall observers in touch with each other's work; in 1866 it became an eight-page magazine, and has now gradually increased to twenty pages, and has attained, under the editorship of Dr. H. R. Mill, to the position of one of the most important monthly meteorological reviews published. Dr. Mill points out that the readers of the magazine frequently tender advice; although this cannot always be adopted individually, he has endeavoured to give effect to the principal desiderata put forward during the last few years. The chief result has been the introduction of a very useful additional table of fifty-four rainfall stations, giving the position and height above sea, and the statistics of rainfall and temperature for each month; it shows the value and date of the maximum and minimum temperature, and the number of nights at or below 32°, both in the shade and on the grass; the thirty years' average and the actual rainfall for the month, the greatest fall in twenty-four hours, and the number of rainy days, together with the mean annual fall. Following numbers will show, somewhat like the Weekly Weather Report of the Meteorological Office, the total rainfall from January 1 to the end of the month dealt with. This new table involves a considerable amount of additional labour, but greatly enhances the value of the publication.

A VERY interesting article on the uranium deposits of St. Joachimsthal is contributed by Dr. Paul Gaubert to No. 1 of vol. iii. of *Le Radium*. The article is illustrated by geological maps of the district and of the mines, and by two photographs of the town. The same number of *Le Radium* contains also a *résumé*, by Prof. G. Sagnac, of the experimental methods used in the study of the transformation of Röntgen rays.

THE report of the International Committee on Atomic Weights for 1905 is published in the Proceedings of the Chemical Society (vol. xxii., No. 303). During the past year there was unusual activity in the determination of atomic weights, and some of the work done relates to the most fundamental values. The entire system of atomic weights is thus affected more or less profoundly, and a general revision would seem to be needed in the near future. In particular, the recent re-determinations of the atomic weights of chlorine, sodium, and nitrogen appear to show that the values obtained by Stas for these elements are now no longer tenable. Guye's work in connection with nitrogen has already been noticed in NATURE (vol. lxxiii., p. 37). The other elements of which the atomic weights have been re-determined are cadmium, carbon, gadolinium, iodine, potassium, silicon, strontium, tellurium, and thorium.

SOME interesting results have been obtained by Mr. Percival Lewis in studying the degree of ionisation in the gases resulting from coloured flames (*Physical Review*, vol. xxi., No. 6). The specific ionic velocity was measured in the case of a Bunsen flame into which solutions of known concentrations of various salts of the alkalis and alkaline earths were sprayed. The ionic velocity apparently varies in the case of each salt inversely as the square root of its concentration in the flame; the specific ionic velocity has, moreover, the same magnitude for ions of the same sign from equimolecular solutions of all the salts of all the alkali metals. The velocity of the negative ions is always somewhat greater than that of the positive ions. The measurements given show also that the rate of re-combination of the ions from the colourless Bunsen flame is much greater than that observed in the case of the coloured flames.

PROF. HENRI MOISSAN in a recent paper gave an account of his experiments on the fusion and distillation of metals of the platinum group. In the current number of the *Comptes rendus* (February 19) he describes similar experiments on the metals of the iron group, the metals examined including nickel, iron, manganese, chromium, molybdenum, tungsten, and uranium. All these were distilled in the electric furnace, but the boiling points varied considerably. The most volatile proved to be manganese, which distils readily before the lime of the furnace is volatilised. Nickel is fairly easy to distil, then chromium, which distils with regularity under the action of a current of 500 amperes at 110 volts. Iron offers difficulties, on account of the dissolved gas causing foaming at the commencement of distillation, but with a current of 1000 amperes at 110 volts 400 grams of iron distilled in twenty minutes. The boiling point of uranium is higher than that of iron. The greatest difficulty was experienced with molybdenum and tungsten; the latter metal, with a current of 500 amperes at 110 volts, showed no signs of fusion in five minutes; even when the current was raised to 800 amperes only 25 grams could be distilled in twenty minutes.

DR. G. H. FOWLER desires it to be known that the Marseilles Exhibition of Oceanography and Sea Fisheries has not been "postponed," as stated in a circular issued by the British Commission of the Milan Exhibition. No postponement of the Marseilles Exhibition has been contemplated, though H.M. Treasury has refused financial support.

MESSRS. SAMPSON LOW, LTD., have just published the eighth edition of Mr. W. T. Lynn's "Remarkable Eclipses" and the thirteenth edition of his "Remarkable Comets." Each book, though it contains only about fifty pages, gives an interesting and accurate statement of the main facts of the subject with which it deals.

THE Country Press, Ball Street, Kensington, W., has issued a series of seven pictorial post-cards on which are shown in an effective manner forty-two species of British ferns. The idea is a good one, and should serve to direct the attention of young people to the beauties of this branch of plant life. Other natural objects are to be dealt with in a similar manner in future series of post-cards.

WE have received a copy of the thirty-seventh annual report of the Wellington College Natural Science Society, that, namely, for 1905. It is quite clear that the society's activity has in no way diminished. The open Saturday meetings provide the boys of the school with excellent fortnightly lectures, the subjects of which are by no means exclusively scientific. The meteorological record is as exhaustive as ever, and some reproduced photographs included in the report show that the photographic section is doing good work.

THE Cambridge University Press has published a third edition of "Hydrodynamics," by Prof. Horace Lamb, F.R.S. The second edition of this standard work was reviewed at length in NATURE of November 21, 1895 (vol. liii., p. 49). In the present issue no further change has been made in the general plan and arrangement of the first edition, but the work has been carefully revised, occasional passages have been re-written, and many interpolations and additions have been made, amounting in all to about one-fifth of the whole.

MR. S. HIRZEL, Leipzig, has commenced the publication of a new and elaborate work entitled "Handbuch der anorganischen Chemie," edited by Dr. R. Abegg, assisted by many leading workers in chemistry—particularly physical chemistry—in Germany and elsewhere. The second part of vol. ii. has recently been issued, the title being "Die Elemente der zweiten Gruppe des periodischen Systems." The first part of this volume has not yet appeared, but the first part of the third volume will be published in the spring of this year. We propose to notice the work when the volumes have been completed.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN MARCH :—

March 1. 6h. 14m. to 7h. 9m. Moon occults f Tauri (mag. 4·3).
,, 2. 6h. 41m. to 7h. 45m. Moon occults γ Tauri (mag. 3·9).
,, ,, 8h. 5m. Minimum of Algol (β Persei).
,, ,, 11h. 51m. to 12h. 40m. Moon occults θ^1 Tauri (mag. 3·9).
,, ,, 12h. 3m. to 12h. 31m. Moon occults θ^2 Tauri mag. 3·6).
,, 11. 16h. 11m. to 16h. 59m. Moon occults γ Virginis (mag. 3·0).
,, 12. 6h. 21m. to 8h. 31m. Transit of Jupiter's Satellite III. (Ganymede).
,, 14. 17h. 22m. to 18h. 23m. Moon occults γ Libræ (mag. 4·1).
,, 15. Venus. Illuminated portion of disc = 0·993 ; of Mars = 0·962.
,, 18. 5h. Mercury at greatest elongation (18° 31′ E.).
,, ,, 10h. 34m. Transit (ingress) of Jupiter's Satellite III. (Ganymede).
,, 19. 12h. 58m. Minimum of Algol (β Persei).
,, 21. 1h. Sun enters Aries. Spring commences.
,, 22. 9h. 47m. Minimum of Algol (β Persei).
,, 29. 10h. Jupiter in conjunction with Moon (Jupiter 4° 32′ N.).
,, ,, 20h. 56m. to 21h. 35m. Moon occults α Tauri (Aldebaran, mag. 1·1).

COMET 1906*a* (BROOKS).—A further extract from Herr M. Ebell's ephemeris for comet 1906*a*, as published in No. 4075 of the *Astronomische Nachrichten*, is given below :—

Ephemeris 12h. M.T. Berlin.

1906	α (true) h. m. s.	δ (true) ° ′	log *r*	log Δ	Brightness
Mar. 6	5 46 7	+60 47	0·2329	0·0909	0·48
8	5 44 18	+58 26	0 2376	0·1072	0·43
10	5 43 6	+56 15	0·2423	0·1236	0·39
12	5 42 22	+54 13	0·2470	0·1398	0·36
14	5 42 2	+52 20	0·2517	0·1559	0·33
16	5 41 58	+50 35	0 2564	0·1718	0·30

This comet is now travelling nearly due south towards the constellation Auriga, and will apparently pass between Capella and β Aurigæ, nearer to the latter, on about March 21.

COMET 1905*c* (GIACOBINI).—Comet 1905*c* has now become so faint as to be beyond the reach of the naked-eye observer. On March 3 it will be only a little brighter than at the time of discovery, and will set just before 9 p.m., or about three hours after sunset, slightly to the south of west.

An extract from Herr A. Wedemeyer's daily ephemeris, as published in No. 4074 of the *Astronomische Nachrichten*, is given below :—

Ephemeris 12h. M.T. Berlin.

1906	α (true) h. m. s.	δ (true) ° ′	log *r*	log Δ	Brightness
Mar. 2	1 53 41	−5 10	0·0384	0·1855	1·20
4	2 2 13	−4 0	0·0546	0·1983	1·05
6	2 10 16	−2 54	0·0700	0 2109	0·92
8	2 17 55	−1 51	0·0846	0·2234	0·81
10	2 25 11	−0 52	0·0986	0·2358	0·72
12	2 32 6	+0 4	0·1120	0·2480	0·64
14	2 38 42	+0 58	0·1248	0·2600	0·57

From this it will be seen that the comet is now apparently traversing the constellation Cetus, and will be about 1° due north of the wonderful variable Mira on the evening of March 7.

A number of full notes of the observation of this comet at the Arcetri Observatory, between December 11 and 31, 1905, are given by Signor A. Abetti in No. 4073 of the *Astronomische Nachrichten*.

LIFE OF PIETRO TACCHINI.—We have received an interesting short biography of Prof. Tacchini, written in Italian by Signor L. Palazzo, who evidently knew the great Italian astronomer intimately, and appreciated his works. The brochure contains nine pages of text and a fine reproduction of Tacchini's portrait; it is published by the Typographical Society of Modena.

SUN-SPOT SPECTRA.—A valuable paper on the spectra of sun-spots is published in No. 1, vol. xxiii., of the *Astrophysical Journal* by Profs. Hale and Adams. The "widened lines" given in the table accompanying the paper number 345, and were measured on ten photographs—including three separate spots—taken with a grating spectrograph in connection with the Snow telescope of the Mount Wilson Solar Observatory.

The region measured was from λ 5000 to λ 5853, and, in a second table, the wave-lengths of a number of "bands" shown in the spot spectrum are also given.

The discussion of the results is extremely interesting, but is too lengthy to be even summarised here. It may be remarked, however, that the lines of titanium showed the greatest mean change of intensity, and that all the silicon lines in the region considered were much weakened.

Reproductions of some of the photographs obtained accompany the paper, and show the widened lines very clearly.

"THE HEAVENS AT A GLANCE."—This well known card calendar reaches its tenth year of issue with the present (1906) copy, which contains the usual data and notes. As in former years, we can only remark that it will be found to be a very handy and useful source of reference to everyone engaged in observational astronomy.

The calendar may be obtained from its author, Mr. A. Mee, Tremynfa, Llanishen (near Cardiff), for sevenpence, post free.

THE LANDSLIDE IN THE RHYMNEY VALLEY.

THE principal source of the Rhymney River is a copious spring in which the rain-water that has disappeared into numerous swallow-holes, and flowed for some distance underground in the Mountain Limestone, again rises to the surface near the edge of the Millstone Grit. From this point the incipient river flows in the direct line of dip of the strata, that is, in a south-south-easterly direction, across the outcrops of the Millstone Grit, the Lower Shale series, and the Pennant Sandstone series of the South Wales Coalfield. The length of its course on the Millstone Grit is nearly two miles, and on the Lower Shale series five miles.